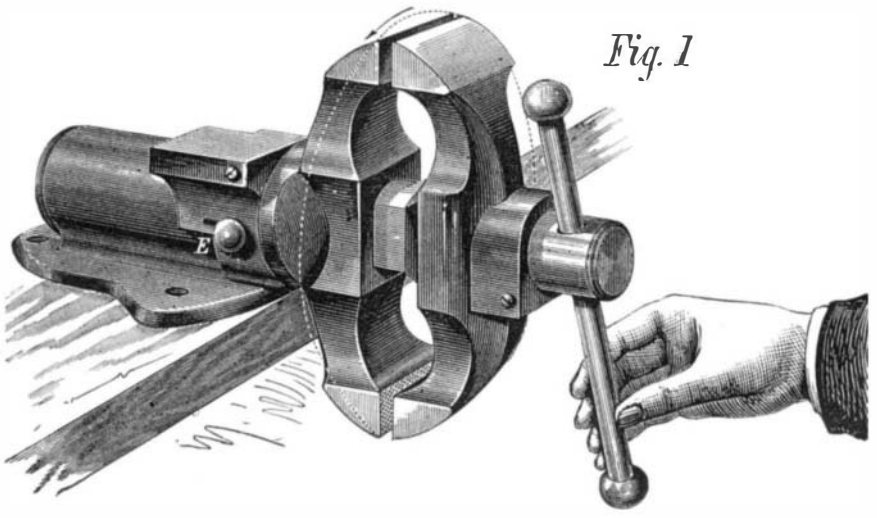
## IMPROVED VISE.

We illustrate herewith a novel form of vise, of simple and strong construction, and possessing double jaws, which may be adjusted so as to hold an object at any desired angle with great firmness. This arrangement offers considerable advantages to the operator, since he can thus place his work in whatever position is best suited to his convenience. A perspective view of the invention is given in Fig. 1, and sectional views in Figs. 2 and 3.

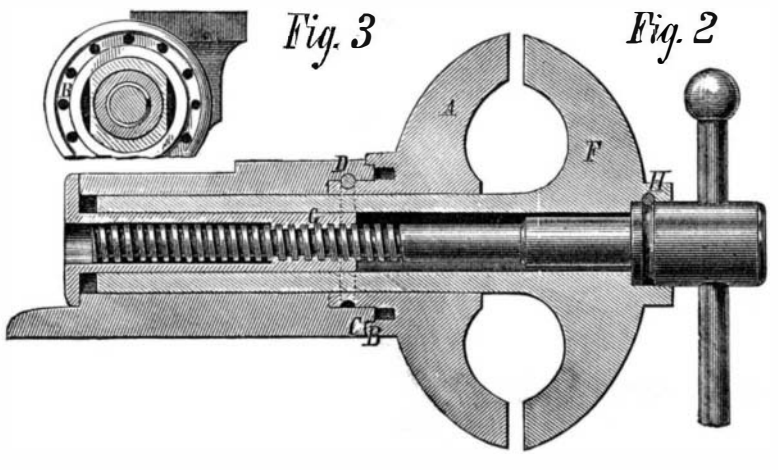
The fixed jaw, A, is grooved at B, Fig. 3, to receive an annular projecting portion of the standard, C, and also has a shank which enters into a socket in said standard. To hold the jaw in its place, a score is cut around the shank, and a similar score is made above in the socket. Into the aperture thus formed a hardened steel pin, D, is placed. This pin prevents the jaw, A, from being drawn out, while it does not interfere with the rotating of said jaw in the direction of the arrow, and as indicated by the dotted lines in Fig. 1. Fig. 3 shows the rear face of the jaw, A, and exhibits in the groove, B, a number of holes. On the standard is a spring bolt, shown at E, Fig. 1, which, when it is desired to adjust the jaws at an angle, is drawn back, and, when the jaw is set, is slipped into one of the apertures, holding it firmly. The movable jaw, F, has a hollow shank which enters the jaw, A, and the standard. Into the end of said shank is placed the flanged nut, G, into which passes the vise screw. The latter is held in place in the movable jaw by a pin, H, arranged in similar manner, to the pin, D, already described. It will be seen, from the shape of the shank of the movable jaw, that that jaw turns with jaw, A, and is held with the latter. The gripping of the jaws is effected by turning the handle in the usual manner, the screw acting in the nut and drawing the parts together very tightly. All parts of the vise are made to gage, so that, when any portion becomes broken, it can be replaced by sending number and size of jaw to the manufacturer.

The faces of one pair of jaws are roughened, and those of the other pair left smooth, to suit different kinds of work. The general construction is such as to prevent any dirt entering the working parts. The pins, H and D, present a novel and ingenious mode of securing the jaws; and although of hardened steel, they sustain but very little of the thrust, and hence are not likely to wear out. They are easily removed, admitting of the implement being taken apart for oiling, etc. A screw thread cut on one end, engaging in a similar thread made in the jaw for pin, H, and in the standard for pin, D, holds each pin firmly in place.

Patented January 26, 1875. For further information address the manufacturer, Elmore Penfield, Middletown, Conn.




PENFIELD'S IMPROVED VISE.




## FOX'S REVERSIBLE CAP.

Mr. Morris Fox, of New York city, has recently invented

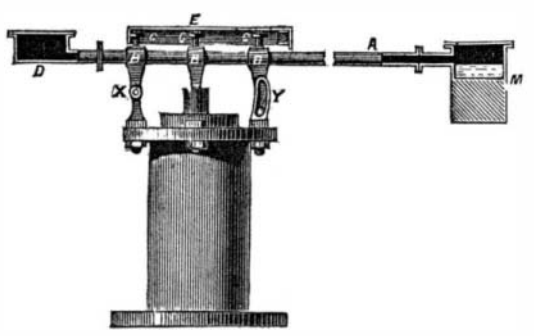
Fig. 1.


a new form of cap for the use of car drivers and others exposed in winter, by their occupations, to the inclemency of the weather. It has a double back section, marked B, in Fig. 1, over the crown of the head, and a double front section, E, Fig. 1, over the front of the head. The front piece, D, is also made double. By detaching loops by which the the sections are fastened when the cap is worn as shown in Fig. 1, the folded rear part, B, may be reversed and extended down to the neck, as shown in Fig. 2; the supplementary crown section, E, is then swung over the front, below the chin, to cover the ears and front part of the neck, and the upper front is thrown over the lower part of the front piece, D, forming a head covering which is claimed to be perfectly waterproof in the roughest weather. The inventor proposes to make one side of each section of fur, as in Fig. 1, and the reverse side of rubber cloth or other waterproof material.

Fig. 2.


## A MERCURIAL SAFETY VALVE.

A new safety valve, the patented invention of Mr. E. W. Colls, is in operation at Erith, near London, and is said to answer exceedingly well. The action of the valve is such that, the moment it begins to move in consequence of an excess of pressure, it opens fully, so as to allow a free escape of steam until the pressure becomes sufficiently reduced in the boiler, when the valve closes as quickly as it opened. This action is brought about in the following manner: A lever, A, consists of a metal tube, having at each end a closed metal box. This tube passes through eyes in the pillars, B B B. One of these pillars, jointed at X, forms the fulcrum upon which the lever works; another presses upon the valve itself, and the third is unattached at its lower extremity, where it has a stud which works up and down in the curved slot, Y. This slot acts as a guide preventing the valve from being forced out of its seat. The screws, C C C, passing through the pillars at the top, press upon and hold the lever, A. To the end of the lever, A, behind the fulcrum, is secured a cast iron box, D, the inside of the bottom of which is a prolongation of the lower level of the tube. At the opposite end of the lever is another box of cast iron, much deeper, the bottom being of thick cast iron to give weight. The space intervening between the floor of this box and the lower level of the tube is filled with mercury, M. The pressure upon the valve is regulated by setting this weighted end of the lever at a proportionate distance from the fulcrum. For this purpose, the lever is duly adjusted, and then secured in its place by the screws, C. When once the lever is adjusted by the engineer or other responsible person, it may be secured from being altered by the man in charge of the boiler by sliding over the head of the screws, C, a tubular cap, E, having a slot formed along it at the bottom for the stems of the screws to pass through. The cap is closed at one end, and at the other is provided with a cover which is applied to it when the cap has been slipped over the heads of the screws. The cap is then secured by a padlock, and all access to the screws is thus prevented




When the maximum pressure of steam at which the valve is set is attained, the valve proceeds to lift slightly, as if constructed in the ordinary way; but the moment this takes place the lever is thrown out of its horizontal position, and the mercury from the weight box begins to flow through the tube into the box behind the fulcrum. The weight of the mercury is thereby displaced from the end of the lever, and acts as a lifting force by being transferred to the rear of the fulcrum. Thus the valve is no longer loaded to the same extent as before, and opens freely for the escape of steam. When the boiler has been relieved of pressure to the extent of two or three pounds, the lever weight is sufficiently heavy to close the valve, and the mercury returns to its original position, thereby preventing the valve from opening again until the maximum pressure is once more attained. As used at the Erith oil works, the steam blows off at a pressure of 35 lbs., and closes when it falls to 32½ lbs. The valve is easily set to a pressure ranging from 10 lbs. to 100 lbs., on the square inch.

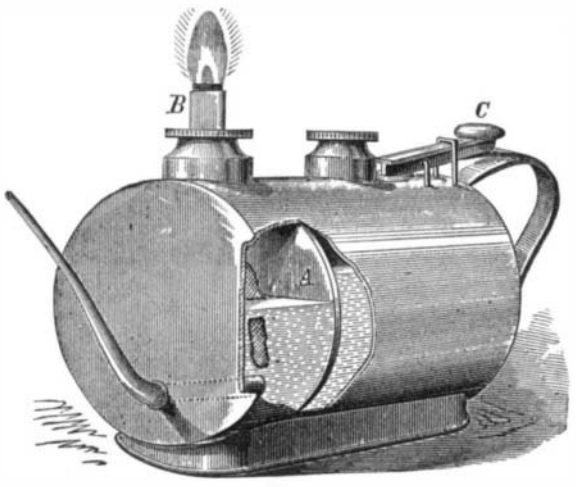
## Japanese Variegated Foil.

Professor Lielegg, of Japan, writes to Europe to describe a process used by the Japanese in the production of a metal leaf used for decorative purposes. Thirty or forty thin plates, of gold, silver, copper, and various alloys, are laid one over the other in a given order, and soldered together at the edges, so that the whole forms a stout plate of metal. Punches of various shapes, conical, pyramidal, with triangular, square, or pentagonal sides, are now used to make a pattern of perforated figures, which exhibit on their inner sides concentric circles, triangles, and other forms corresponding to the punches used. The plate so prepared is hammered and rolled until it has become quite thin, the holes disappear, and the figures have spread out, preserving, however, their parallelism. A number of broken, straight, and curved lines are thus produced, their effect being further enriched by the use of acids to modify the colors. Thin plates prepared in this way have an extremely flexible nature, admitting relief, with stamped or engraved designs; and, capable of receiving the most varied colors and forms, will have many uses in decorative art.

## ROBERTS' COMBINED LAMP AND OIL CAN.

A simple little invention is illustrated in the annexed engraving, which, we think, will prove of considerable convenience to engineers. Any one who has ever attempted to oil out-of-the-way machinery in the dark, and especially in the confined limits of a steamboat's hold, will understand that keeping one's self clear of the moving parts, while both hands are occupied, the one with a lamp, the other with an oil can, is certainly not an easy, and is in some respects a perilous, operation. The present device, which combines lamp and oil can in one, allows one hand to be free, so that the user can steady and support himself, and in addition a further advantage is offered in having a light so placed as to illuminate the darkest recesses of the machine, which it otherwise might be difficult to light up sufficiently to enable oil cups to be readily found.

As shown in the engraving, a cylindrical vessel is provided




with a flanged stand, and is divided within by a partition, A. The large space nearest the handle serves to hold lubricating oil, and the spout therefor passes through the partition and the small space, which contains lamp oil, and extends in a nozzle outside the can in the usual manner. The lamp oil space is filled through the aperture, at B, in the cover of which a lamp burner is arranged carrying the usual wick. The flow of lubricating oil is regulated by a spring lever, C, by which a small air hole is closed or opened at will.

Patented through the Scientific American Patent Agency